Monitoring
For *Business-Critical Continuity™*

Liebert IntelliSlot® 485

Modbus Reference Guide

Liebert®

EMERSON™
Network Power

TABLE OF CONTENTS

1.0 MODBUS COMMUNICATIONS 1

1.1 Connectivity to Liebert IntelliSlot 485 Using Modbus 1

1.2 Compatibility with Liebert Equipment 1

Table 1 Liebert Equipment and Compatible Liebert IntelliSlot 485 Cards 1

1.3 Implementation Basics 1

1.4 Transmission Format 1

Table 2 Modbus Remote Transmission Unit settings for Liebert IntelliSlot 485 interface card 1

1.5 Modbus Packet Format 2

1.5.1 Device Address 2

1.5.2 Function Code 2

Table 3 Supported Modbus function codes 2

1.5.3 Data Fields 2

1.5.4 Error Check Field 2

1.6 RTU Framing 3

Table 4 Query sample 3

Table 5 Response sample 3

2.0 SUPPORTED MODBUS POINTS 4

Table 6 Liebert Nfinity® - Status and Coil 4

Table 7 Liebert Nfinity - Input and Holding Registers 5

Table 8 Liebert NX™ - Status and Coil 7

Table 9 Liebert NX - Input and Holding Registers 9

Table 10 Liebert PowerSure™ Interactive - Status and Coil 12

Table 11 Liebert PowerSure Interactive - Input and Holding Registers 13

Table 12 Liebert PowerSure Interactive 2 - Status and Coil 15

Table 13 Liebert PowerSure Interactive 2 - Input and Holding Registers 17

Table 14 Liebert GXT2™ - Status and Coil 19

Table 15 Liebert GXT2 - Input and Holding Registers 21

Table 16 Liebert HiNet™ - Status and Coil 23

Table 17 Liebert HiNet - Input and Holding Registers 24

Table 18 Liebert Series 600™ UPS - Status and Coil 25

Table 19 Liebert Series 600 UPS - Input and Holding Registers 26

Table 20 Liebert Series 610™ SCC UPS - Status and Coil 28

Table 21 Liebert Series 610 SCC UPS - Input and Holding Registers 29

Table 22 Liebert Series 300™ UPS - Status and Coil 30

Table 23 Liebert Series 300 UPS - Input and Holding Registers 31

Table 24 Liebert DS™ - Status and Coil 33

Table 25 Liebert DS - Input and Holding Registers 36

Table 26 Liebert XDF™ - Status and Coil 39

Table 27 Liebert XDF - Input and Holding Registers 42

1.0 MODBUS COMMUNICATIONS

1.1 Connectivity to Liebert IntelliSlot 485 Using Modbus

This publication describes using the Modbus communications protocol with the Liebert IntelliSlot 485 interface card, as well as with the Liebert OpenComms™ 485 Card and Liebert OpenComms NIC485 Card. It includes information on using Modbus to pass information to and from the Liebert IntelliSlot 485 card via Modbus. It also offers information about supported types, frame format, function code support and similar subjects.

1.2 Compatibility with Liebert Equipment

Table 1 shows the type of Liebert IntelliSlot 485 card required for selected Liebert products.

Table 1 Liebert Equipment and Compatible Liebert IntelliSlot 485 Cards

Product Supported	Card
Liebert Nfinity	Liebert IntelliSlot 485 Card
Liebert NX	Liebert IntelliSlot 485 Card
Liebert PowerSure	Liebert IntelliSlot 485 Card
Liebert GXT2	Liebert IntelliSlot 485 Card
Liebert HiNet	Liebert IntelliSlot 485 Card
Liebert Series 600 UPS	Liebert IntelliSlot Web/485 Card with Adapter
	Liebert IntelliSlot 485 Card with Adapter
Liebert Series 610 SCC	Liebert IntelliSlot Web/485 Card with Adapter
	Liebert IntelliSlot 485 Card with Adapter
Liebert Series 300 UPS	Liebert IntelliSlot Web/485 Card with Adapter
	Liebert IntelliSlot 485 Card with Adapter
Liebert DS	Liebert IntelliSlot 485 Card
Liebert XDF	Liebert IntelliSlot 485 Card

1.3 Implementation Basics

Modbus protocol provides control and data acquisition, through query and response, between master and slave devices. This protocol comprises the rules for communication, controlling the message format between devices, how master and slave devices initiate communications, as well as unit identification, message-handling and error-checking.

The Liebert IntelliSlot 485 card acts as a slave device on a network. This network can be a multidrop configuration over EIA-485, where multiple slaves reside on a common wire or loop.

1.4 Transmission Format

The Liebert IntelliSlot 485 interface card supports Modbus Remote Terminal Unit (RTU) transmission modes. See **Table 2** below.

Table 2 Modbus Remote Transmission Unit settings for Liebert IntelliSlot 485 interface card

Physical Port	Transmission Mode	Baud Rate	Data Bits	Parity Bits	Stop Bits	Start Bits
EIA-485/422 2 wire	RTU	9600, 19200 or 38400	8	None	1	1

1.5 Modbus Packet Format

Each Modbus packet consists of these fields:

- Device Address
- Function Code
- Data Field(s)
- Error Check Field

1.5.1 Device Address

The address field immediately follows the beginning of the frame and consists of 8-bits (RTU). This bit indicates the user-assigned address of the slave device that is to receive the message from the attached master device.

Each slave must be assigned a unique address. Only the addressed slave will respond to a query that contains its address.

1.5.2 Function Code

The function code field tells the addressed slaves what function to perform. Function codes are specifically designed invoke a specific action by the slave device. The function code range is from 1 to 127.

Liebert IntelliSlot 485 Modbus server supports the following Modbus function codes.

Table 3 Supported Modbus function codes

Code	Function	Description
01	Read Coils	Read from 1 to 2000 contiguous status of coils managed by the server. Coils in the response message are packed as one per bit of a byte, 1=On and 0=Off. If the requested quantity of coils is not a multiple of 8, zeros are padded in the final byte.
02	Read Discrete Inputs	Read from 1 to 2000 contiguous input status managed by the server. Discrete inputs in the response message are packed as one per bit of a byte, 1=On and 0=Off. If the requested number of inputs is not a multiple of 8, zeros are padded in the final byte.
03	Read Holding Registers	Read the contents of contiguous block of 1 to 127 holding registers. Data are packed as two bytes per register; the first byte contains the high order bits.
04	Read Input Registers	Read the contents of contiguous block of 1 to 127 Input registers. Data are packed as two bytes per register; the first byte contains the high order bits.
05	Write Single Coil	Write a single output to either On (1) or Off (0) mapped in coil section.
06	Write Single Register	Write a value into a single holding register;
15	Write Multiple Coils	Force each coil in a sequence of coils to either On or Off.
16	Write Multiple Registers	Write values into a block of contiguous registers (1 to 120)

1.5.3 Data Fields

The data field length varies, depending on whether the message is a request or a response to a packet. This field typically contains information required by the slave device to perform the command specified or to the response to a data request from the master device.

1.5.4 Error Check Field

The Error Check Field consists of a 16-bit (2 byte) Cyclical Redundancy Check (CRC16). It allows the receiving device to detect a packet that has been corrupted by transmission errors.

1.6 RTU Framing

The example below shows a typical query and response from a Liebert IntelliSlot 485 interface card. The master device initiates a query asking **Slave Device**, with address 2, for **holding registers** starting at **holding register 40051** (offset 50) and including next **2 registers** (3 total).

Table 4 Query sample

Slave Address	Function Code	Starting Register		Number of Registers		CRC16	CRC16
		Hi Byte	Lo Byte	Hi Byte	Lo Byte	Hi Byte	Lo Byte
02	03	00	32	00	03	E5	FA

Table 5 Response sample

Slave Address	Function Code	Count: Bytes of Data	Register						CRC16	
			40051 Data		40052 Data		40053 Data		Hi Byte	Lo Byte
			Hi	Lo	Hi	Lo	Hi	Lo		
02	03	6	1	58	00	FA	00	54	1B	0D

Slave Device, with address 2, responds to Function Code 3 with 6 bytes of hexadecimal data and ends with CRC16 checksum.

Register values:	40051 =	158(hex) =	344 (decimal)
	40052 =	FA (hex) =	250 (decimal)
	40053 =	54 (hex) =	84 (decimal)

2.0 SUPPORTED MODBUS POINTS

This section includes two types of tables—(a) **Status and Coil** and (b) **Input and Holding Registers**—for each Liebert unit.

Note for **Input and Holding Registers** tables: a value read from an input register is the real-time data value; a value read from a holding register is the value last set to this Modbus server by a user.

Table 6 Liebert Nfinity® - Status and Coil

Data Point	Status	Coil	Number of Bits	Notes/Units
Automatic Battery Test Enabled	10003	3	1	-
Battery Charger On	10044	-	1	-
Inverter Ready	10047	-	1	-
Power Factor Correction State	10050	-	1	-
Load on Inverter	10073	-	1	-
Bypass Active	10074	-	1	-
Replace Battery	10081	-	1	-
Battery Under Test	10082	-	1	-
Load on Battery	10128	-	1	-
Load on Bypass	10129	-	1	-
Load on Manual Bypass	10132	-	1	-
Load Transferred to Bypass Due to UPS Fault	10134	-	1	-
Transfer Inhibit	10146	-	1	-
Output Off Pending	10151	-	1	-
Low Battery - Shutdown Imminent	10152	-	1	-
Output Overload	10154	-	1	-
UPS Overload	10155	-	1	-
Output Off	10158	-	1	-
Check Air Filter - Replace	10170	-	1	-
Transformer Over Temperature	10178	-	1	-
Input Power Supply Fail	10186	-	1	-
Internal Device Communication Failure	10284	-	1	-
Device Active Alarm	10290	-	1	-
Main Control Warning	10291	-	1	-
Redundant Control Warning	10292	-	1	-
Control Module Failure	10293	-	1	-
Redundant Control Module Failed	10294	-	1	-
User Interface Module Failed	10295	-	1	-
UPS Power Not Redundant	10296	-	1	-
Power Module Failure	10298	-	1	-
Battery Module Failure	10299	-	1	-
Power Module Warning	10300	-	1	-
Battery Module Warning	10301	-	1	-

Table 7 Liebert Nfinity - Input and Holding Registers

Data Point	Input Register	Holding Register	# of Reg.	Scale	Notes/Units
Number of Input Lines	30004	40004	1	1	Bits 12 - 15
Number of Bypass Lines	30004	40004	1	1	Bits 4 - 7
Number of Output Lines	30004	40004	1	1	Bits 8 - 11
Number of Power Mod.	30010	40010	1	1	-
Number of Battery Modules Installed	30011	40011	1	1	-
Device Maximum Frame Capacity	30023	40023	2	1	-
Device System Capacity	30025	40025	2	1	VA
Nominal Input Voltage	30027	40027	1	1	V
Nominal Output Voltage	30028	40028	1	1	V
Nominal Static Bypass Switch Voltage	30029	40029	1	1	V
Nominal Input Frequency	30031	40031	1	10	Hz
Nominal Output Frequency	30032	40032	1	10	Hz
Nominal Power Factor	30033	40033	1	100	-
Nominal Battery Voltage	30034	40034	1	1	V
Auto Restart Delay	30051	40051	1	1	seconds
Device Auto Restart Percent Setpt	30052	40052	1	1	%
Device Low Battery Time	30053	40053	1	1	min
Next Battery Auto Test Time	30057	40057	1	1	minutes
Overload Alarm Limit	30067	40067	2	1	VA
Minimum Redundant Power Modules	30074	40074	1	1	-
Load (Apparent Power)	30102	-	2	1	VA
Load (Real Power)	30104	-	2	1	W
Load / Capacity	30106	-	1	1	%
Input Frequency	30107	-	1	10	Hz
Output Frequency	30108	-	1	10	Hz
Bypass Frequency	30109	-	1	10	Hz
Battery Charge Status	30112	-	1	-	1 - 100% Charged 2 - Less than 100% Charged 3 - Charging 4 - Discharging 5 - Float Charging 6 - Equalize Charging
Battery Voltage	30113	-	1	1	V
Battery Time Remaining	30115	-	1	1	min
Battery Charge Percentage	30116	-	1	1	%
Battery Temperature	30117	-	1	1	degrees C
Transformer Temperature	30121	-	1	1	degrees C
Redundant Power Modules	30124	-	1	1	-
Active Power Module Count	30126	-	1	1	-

Table 7 Liebert Nfinity - Input and Holding Registers

Data Point	Input Register	Holding Register	# of Reg.	Scale	Notes/Units
Battery Module Active Count	30127	-	1	1	-
Battery Test Result	30130	-	1	1	-
Input Voltage L1	30153	-	1	1	V
Input Current L1	30154	-	1	1	A
Bypass Voltage L1	30159	-	1	1	V
Bypass Current L1	30160	-	1	1	A
Output Voltage L1	30163	-	1	1	V
Output Current L1	30164	-	1	1	A
Power Module Failure Count	30304	-	1	1	-
Battery Module Failure Count	30305	-	1	1	-
Power Module Warning Count	30306	-	1	1	-
Battery Module Warning Count	30307	-	1	1	-

Table 8 Liebert NX™ - Status and Coil

Data Point	Status	Coil	Number of Bits	Scale	Notes / Units
Economode	10005	5	-	-	-
DC-To-DC Converter On	10042	-	-	-	-
Battery Charge Compensation	10046	-	-	-	-
Inverter Ready	10047	-	-	-	-
Power Factor Correction State	10050	-	-	-	-
Battery Charge Mode	10051	-	-	-	-
Load On Inverter	10073	-	-	-	-
Bypass Active	10074	-	-	-	-
Battery Under Test	10082	-	-	-	-
Load On Battery	10128	-	-	-	-
Overload Transfer To Bypass	10131	-	-	-	-
Input Switch Open	10137	-	-	-	-
Generator Disconnected	10141	-	-	-	-
Bypass Transfer Count Block	10147	-	-	-	-
Static Bypass Switch Disabled	10148	-	-	-	-
Low Battery - Shutdown Imminent	10152	-	-	-	-
Output Overload	10154	-	-	-	-
UPS Load Joint Mode	10156	-	-	-	-
Output Off	10158	-	-	-	-
Inverter Unsynchronized	10160	-	-	-	-
Main Neutral Lost	10161	-	-	-	-
Fan Failure	10169	-	-	-	-
Ambient Over Temperature	10173	-	-	-	-
Rectifier Over Temperature	10174	-	-	-	-
Rectifier Inductor Over Temperature	10175	-	-	-	-
Inverter Over Temperature	10176	-	-	-	-
Inverter Inductor Over Temperature	10177	-	-	-	-
Battery Converter Over Temperature	10179	-	-	-	-
DC Bus Balancer Over Temperature	10180	-	-	-	-
Input Power Supply Fail	10186	-	-	-	-
Input BrownOut	10189	-	-	-	-
Bad Input Frequency	10190	-	-	-	-
Bypass Phase Rotation Error	10191	-	-	-	-
Bypass Phase Loss	10201	-	-	-	-
Bypass Input Voltage/Frequency Fault	10202	-	-	-	-
Output Fuse Blown	10217	-	-	-	-
Output Over Voltage	10219	-	-	-	-
Charger Failed	10234	-	-	-	-

Table 8 Liebert NX™ - Status and Coil

Data Point	Status	Coil	Number of Bits	Scale	Notes / Units
Battery Fault	10235	-	-	-	-
Battery Contact Fail	10236	-	-	-	-
Battery Converter Over Current	10237	-	-	-	-
Battery Converter Fail	10238	-	-	-	-
DC Bus Balancer Over Current	10239	-	-	-	-
DC Bus Balancer Fault	10240	-	-	-	-
DC Bus 1 Power Supply Fail	10251	-	-	-	-
Rectifier Fuse Fail	10257	-	-	-	-
Rectifier Startup Failure	10258	-	-	-	-
Rectifier Fault	10259	-	-	-	-
Rectifier Current Limit	10260	-	-	-	-
Inverter DC Voltage Low Shutdown	10262	-	-	-	-
Inverter Fault	10263	-	-	-	-
Inverter DC Offset Overload	10264	-	-	-	-
Inverter Contactor Fail	10265	-	-	-	-
Inverter Current Limit	10266	-	-	-	-
Parallel Low Battery Warning	10267	-	-	-	-
Load Share Fault	10268	-	-	-	-
Parallel System Fault	10269	-	-	-	-
Parallel Connection Error	10270	-	-	-	-
Parallel System Overload	10271	-	-	-	-
Parallel Transfer To Static Bypass Switch	10272	-	-	-	-
Inverter Communication Fail	10281	-	-	-	-
Rectifier Communication Failure	10282	-	-	-	-
Parallel Communication Fault	10283	-	-	-	-
Operation Fault	10289	-	-	-	-

Table 9 Liebert NX - Input and Holding Registers

Data Point	Input Register	Holding Register	# of Reg.	Scale	Notes / Units
Number of Input Lines	30004	40004	1	1	Bits 12 - 15
Number of Bypass Lines	30004	40004	1	1	Bits 4 - 7
Number of Output Lines	30004	40004	1	1	Bits 8 - 11
Number of SubModules	30009	40009	1	-	-
Module Number	30014	40014	1	-	-
Device Module Count	30015	40015	1	-	-
Device Redundant Count	30016	40016	1	-	-
Device Module Mode	30017	40017	1	-	-
Nominal Power Rating	30021	40021	2	-	VA
Nominal Input Voltage	30027	40027	1	-	V
Nominal Output Voltage	30028	40028	1	-	V
Nominal Static Bypass Switch Voltage	30029	40029	1	-	V
Nominal Input Frequency	30031	40031	1	10	Hz
Nominal Output Frequency	30032	40032	1	10	Hz
Nominal Power Factor	30033	40033	1	100	-
Nominal DC Bus #1 Voltage	30035	40035	1	-	V
Nominal DC Bus #2 Voltage	30036	40036	1	-	-
Nominal Battery Float Voltage	30038	40038	1	-	V
Load Bus Sync Mode	30040	40040	1	-	-
Auto Restart Delay	30051	40051	1	1	Seconds
Device Low Battery Time	30053	40053	1	-	Minutes
Input Frequency	30107	-	1	10	Hz
Output Frequency	30108	-	1	10	Hz
Bypass Frequency	30109	-	1	10	Hz
Battery Charge Status	30112	-	1	-	1 - 100% Charged 2 - Less than 100% Charged 3 - Charging 4 - Discharging 5 - Float Charging 6 - Equalize Charging
Battery Voltage	30113	-	1	-	V
Battery Current (Charge/Discharge)	30114	-	1	-	A
Battery Time Remaining	30115	-	1	-	Minutes
Battery Charge Percentage	30116	-	1	-	%
Battery Temperature	30117	-	1	-	C
Ambient Temperature	30119	-	1	-	C
Parallel Load Source	30128	-	1	-	-
Rotary Breaker	30129	-	1	-	-

Table 9 Liebert NX - Input and Holding Registers

Data Point	Input Register	Holding Register	# of Reg.	Scale	Notes / Units
Battery Test Result	30130	-	1	-	1 - Unknown 2 - Passed 3 - Failed 4 - In Progress 5 - System Failure 6 - Inhibited
Input Voltage L1-L2	30151	-	1	-	V
Input Voltage L1	30153	-	1	-	V
Input Current L1	30154	-	1	-	A
Input Power Factor L1	30155	-	1	100	-
Bypass Voltage L1	30159	-	1	-	V
Output Voltage L1	30163	-	1	-	V
Output Current L1	30164	-	1	-	A
Output Load L1	30165	-	1	1	-
Output Power Factor L1	30166	-	1	100	%
Apparent Output Power L1	30168	-	2	-	VA
Reactive Output Power L1	30170	-	2	-	VAR
Output Power L1	30172	-	2	-	W
Output Current Crest Factor L1	30186	-	1	-	%
Input Voltage L2-L3	30201	-	1	-	V
Input Voltage L2	30203	-	1	-	V
Input Current L2	30204	-	1	-	A
Input Power Factor L2	30205	-	1	100	-
Bypass Voltage L2	30209	-	1	-	V
Output Voltage L2	30213	-	1	-	V
Output Current L2	30214	-	1	-	A
Output Load L2	30215	-	1	1	%
Output Power Factor L2	30216	-	1	100	-
Apparent Output Power L2	30218	-	2	-	VA
Reactive Output Power L2	30220	-	2	-	VAR
Output Power L2	30222	-	2	-	W
Output Current Crest Factor L2	30236	-	1	-	%
Input Voltage L3-L1	30251	-	1	-	V
Input Voltage L3	30253	-	1	-	V
Input Current L3	30254	-	1	-	A
Input Power Factor L3	30255	-	1	100	-
Bypass Voltage L3	30259	-	1	-	V
Output Voltage L3	30263	-	1	-	V
Output Current L3	30264	-	1	-	A
Output Load L3	30265	-	1	1	%

Table 9 Liebert NX - Input and Holding Registers

Data Point	Input Register	Holding Register	# of Reg.	Scale	Notes / Units
Output Power Factor L3	30266	-	1	100	-
Apparent Output Power L3	30268	-	2	-	VA
Reactive Output Power L3	30270	-	2	-	VAR
Output Power L3	30272	-	2	-	W
Output Current Crest Factor L3	30286	-	1	-	%

Table 10 Liebert PowerSure™ Interactive - Status and Coil

Data Point	Status	Coil	Number of Bits	Notes/Units
Audible Alarm Enabled	10002	2	1	-
Automatic Battery Test Enabled	10003	3	1	-
Battery Charge Compensation	10046	-	1	-
Inverter Ready	10047	-	1	-
Load Circuit 1 State	10057	-	1	-
Load Circuit 2 State	10058	-	1	-
Load Circuit 3 State	10059	-	1	-
Load Circuit 4 State	10060	-	1	-
Load Circuit 5 State	10061	-	1	-
Load Circuit 6 State	10062	-	1	-
Load Circuit 7 State	10063	-	1	-
Load Circuit 8 State	10064	-	1	-
Load Circuit 9 State	10065	-	1	-
Load Circuit 10 State	10066	-	1	-
Load Circuit 11 State	10067	-	1	-
Load Circuit 12 State	10068	-	1	-
Load Circuit 13 State	10069	-	1	-
Load Circuit 14 State	10070	-	1	-
Load Circuit 15 State	10071	-	1	-
Load Circuit 16 State	10072	-	1	-
Load On Inverter	10073	-	1	-
Boost Mode On	10075	-	1	-
Buck Mode On	10076	-	1	-
Battery Under Test	10082	-	1	-
Shutdown Reason - Over Temperature	10086	-	1	-
Shutdown Reason - Overload	10087	-	1	-
Shutdown - Output Short	10089	-	1	-
Shutdown Reason - Remote Shutdown	10093	-	1	-
Load On Battery	10128	-	1	-
Output Off Pending	10151	-	1	-
Low Battery - Shutdown Imminent	10152	-	1	-
Output Overload	10154	-	1	-
Over Temperature Warning	10171	-	1	-
Battery Over Temperature CB Trip	10172	-	1	-
Input Power Supply Fail	10186	-	1	-
Input Over Voltage	10187	-	1	-
Input Under Voltage	10188	-	1	-
Bad Input Frequency	10190	-	1	-
Output Under Voltage	10218	-	1	-
Output Over Voltage	10219	-	1	-

Table 11 Liebert PowerSure Interactive - Input and Holding Registers

Data Point	Input Register	Holding Register	# of Reg.	Scale	Notes / Units
Number of Input Lines	30004	40004	1	1	Bits 12 - 15
Number of Bypass Lines	30004	40004	1	1	Bits 4 - 7
Number of Output Lines	30004	40004	1	1	Bits 8 - 11
Number of SubModules	30009	40009	1	1	-
Load Circuit Present	30013	40013	1	-	There are 16 possible Load Circuits. Each bit represents 1 load circuit. Load Circuit 1 is bit 0, Load Circuit 2 is bit 1 and so on. If the bit is 1, then the Load Circuit is supported.
Nominal Power Rating	30021	40021	2	1	VA
Nominal Input Voltage	30027	40027	1	1	V
Nominal Output Voltage	30028	40028	1	1	V
Nominal Input Current	30030	40030	1	1	A
Nominal Input Frequency	30031	40031	1	10	Hz
Nominal Output Frequency	30032	40032	1	10	Hz
Nominal Power Factor	30033	40033	1	100	-
Nominal Battery Voltage	30034	40034	1	1	V
Auto Restart Delay	30051	40051	1	1	seconds
Device Low Battery Time	30053	40053	1	1	min
Load (Apparent Power)	30102	-	2	1	VA
Load / Capacity	30106	-	1	1	%
Input Frequency	30107	-	1	10	Hz
Output Frequency	30108	-	1	10	Hz
Battery Charge Status	30112	-	1	-	1 - 100% Charged 2 - Less than 100% Charged 3 - Charging 4 - Discharging 5 - Float Charging 6 - Equalize Charging
Battery Voltage	30113	-	1	1	V
Battery Time Remaining	30115	-	1	1	min
Battery Charge Percentage	30116	-	1	1	%
Battery Test Result	30130	-	1	1	1 - Unknown 2 - Passed 3 - Failed 4 - In Progress 5 - System Failure 7 - Inhibited
Input Voltage L1	30153	-	1	1	V
Output Voltage L1	30163	-	1	1	V
Output Current L1	30164	-	1	1	A
Input Maximum Voltage L1	30180	-	1	1	V
Input Minimum Voltage L1	30181	-	1	1	V
Output Maximum Voltage L1	30182	-	1	1	V
Output Minimum Voltage L1	30183	-	1	1	V

Table 11 Liebert PowerSure Interactive - Input and Holding Registers

Data Point	Input Register	Holding Register	# of Reg.	Scale	Notes / Units
Black Out Count	30301	-	1	1	-
Brown Out Count	30302	-	1	1	-

Table 12 Liebert PowerSure Interactive 2 - Status and Coil

Data Point	Status	Coil	Number of Bits	Notes / Units
Audible Alarm Enabled	10002	2	1	-
Automatic Battery Test Enabled	10003	3	1	-
DC-To-DC Converter On	10042	-	1	-
Battery Charger On	10044	-	1	-
Load Circuit 1 State	10057	-	1	-
Load Circuit 2 State	10058	-	1	-
Load Circuit 3 State	10059	-	1	-
Load Circuit 4 State	10060	-	1	-
Load Circuit 5 State	10061	-	1	-
Load Circuit 6 State	10062	-	1	-
Load Circuit 7 State	10063	-	1	-
Load Circuit 9 State	10065	-	1	-
Load Circuit 10 State	10066	-	1	-
Load Circuit 11 State	10067	-	1	-
Load Circuit 12 State	10068	-	1	-
Load Circuit 13 State	10069	-	1	-
Load Circuit 14 State	10070	-	1	-
Load Circuit 15 State	10071	-	1	-
Load Circuit 16 State	10072	-	1	-
Load On Inverter	10073	-	1	-
Boost Mode On	10075	-	1	-
Buck Mode On	10076	-	1	-
Replace Battery	10081	-	1	-
Battery Under Test	10082	-	1	-
Shutdown Reason - Over Temperature	10086	-	1	-
Shutdown Reason - Overload	10087	-	1	-
Shutdown Reason - Output Short	10089	-	1	-
Shutdown Reason - Line Neutral Swap	10090	-	1	-
Shutdown Reason - Low Battery	10092	-	1	-
Shutdown Reason - Remote Shutdown	10093	-	1	-
Shutdown Reason - Input Under Voltage	10094	-	1	-
Shutdown Reason - Hardware	10096	-	1	-
Load On Battery	10128	-	1	-
Output Off Pending	10151	-	1	-
Low Battery - Shutdown Imminent	10152	-	1	-
Output Overload	10154	-	1	-
Over Temperature Warning	10171	-	1	-
Input Power Supply Fail	10186	-	1	-
Input Over Voltage	10187	-	1	-

Table 12 Liebert PowerSure Interactive 2 - Status and Coil

Data Point	Status	Coil	Number of Bits	Notes / Units
Input Under Voltage	10188	-	1	-
Input BrownOut	10189	-	1	-
Bad Input Frequency	10190	-	1	-
Output Under Voltage	10218	-	1	-
Output Over Voltage	10219	-	1	-
Charger Failed	10234	-	1	-
Battery Under Voltage	10241	-	1	-
Battery Over Voltage	10242	-	1	-

Table 13 Liebert PowerSure Interactive 2 - Input and Holding Registers

Data Point	Input Register	Holding Register	# of Reg.	Scale	Notes / Units
Number of Input Lines	30004	40004	1	1	Bits 12 - 15
Number of Output Lines	30004	40004	1	1	Bits 8 - 11
Number of SubModules	30009	40009	1	1	-
Load Circuit Present	30013	40013	1	-	There are 16 possible Load Circuits. Each bit represents 1 load circuit. Load Circuit 1 is bit 0, Load Circuit 2 is bit 1 and so on. If the bit is 1, then the Load Circuit is supported.
Nominal Power Rating	30021	40021	2	1	VA
Nominal Input Voltage	30027	40027	1	1	V
Nominal Output Voltage	30028	40028	1	1	V
Nominal Input Current	30030	40030	1	1	A
Nominal Input Frequency	30031	40031	1	10	Hz
Nominal Output Frequency	30032	40032	1	10	Hz
Nominal Power Factor	30033	40033	1	100	-
Nominal Battery Voltage	30034	40034	1	1	V
Nominal Battery Capacity	30037	40037	1	1	minutes
Nominal Battery Float Voltage	30038	40038	1	1	V
Auto Restart Delay	30051	40051	1	1	seconds
Device Low Battery Time	30053	40053	1	1	min
Ambient Temperature Warning Point	30069	40069	1	1	degrees C
Over Temperature Limit Point	30072	40072	1	1	degrees C
Load (Apparent Power)	30102	-	2	1	VA
Load (Real Power)	30104	-	2	1	W
Load / Capacity	30106	-	1	1	%
Input Frequency	30107	-	1	10	Hz
Output Frequency	30108	-	1	10	Hz
Battery Charge Status	30112	-	1	-	1 - 100% Charged 2 - Less than 100% Charged 3 - Charging 4 - Discharging 5 - Float Charging 6 - Equalize Charging
Battery Voltage	30113	-	1	1	V
Battery Time Remaining	30115	-	1	1	min
Battery Charge Percentage	30116	-	1	1	%
Ambient Temperature	30119	-	1	1	degrees C
Battery Test Result	30130	-	1	1	-
Input Voltage L1	30153	-	1	1	V
Input Current L1	30154	-	1	1	A

Table 13 Liebert PowerSure Interactive 2 - Input and Holding Registers

Data Point	Input Register	Holding Register	# of Reg.	Scale	Notes / Units
Output Voltage L1	30163	-	1	1	V
Output Current L1	30164	-	1	1	A
Input Maximum Voltage L1	30180	-	1	1	V
Input Minimum Voltage L1	30181	-	1	1	V
Output Maximum Voltage L1	30182	-	1	1	V
Output Minimum Voltage L1	30183	-	1	1	V
Black Out Count	30301	-	1	1	-
Brown Out Count	30302	-	1	1	-

Table 14 Liebert GXT2™ - Status and Coil

Data Point	Status	Coil	Number of Bits	Notes / Units
Audible Alarm Enabled	10002	2	1	-
Automatic Battery Test Enabled	10003	3	1	-
DC-to-DC Converter On	10042	-	1	-
Battery Charge Compensation	10046	-	1	-
Inverter Ready	10047	-	1	-
Power Factor Correction State	10050	-	1	-
Load Circuit 1 State	10057	-	1	-
Load Circuit 2 State	10058	-	1	-
Load Circuit 3 State	10059	-	1	-
Load Circuit 4 State	10060	-	1	-
Load Circuit 5 State	10061	-	1	-
Load Circuit 6 State	10062	-	1	-
Load Circuit 7 State	10063	-	1	-
Load Circuit 8 State	10064	-	1	-
Load Circuit 9 State	10065	-	1	-
Load Circuit 10 State	10066	-	1	-
Load Circuit 11 State	10067	-	1	-
Load Circuit 12 State	10068	-	1	-
Load Circuit 13 State	10069	-	1	-
Load Circuit 14 State	10070	-	1	-
Load Circuit 15 State	10071	-	1	-
Load Circuit 16 State	10072	-	1	-
Load On Inverter	10073	-	1	-
Bypass Active	10074	-	1	-
Replace Battery	10081	-	1	-
Battery Under Test	10082	-	1	-
Shutdown Reason - Over Temperature	10086	-	1	-
Shutdown Reason - Overload	10087	-	1	-
Shutdown Reason - Link Over Voltage	10088	-	1	-
Shutdown Reason - Output Short	10089	-	1	-
Shutdown Reason - Line Neutral Swap	10090	-	1	-
Shutdown Reason - Low Battery	10092	-	1	-
Shutdown Reason - Remote Shutdown	10093	-	1	-
Shutdown Reason - Input Under Voltage	10094	-	1	-
Shutdown Reason - PFC Startup	10095	-	1	-
Shutdown Reason - Hardware	10096	-	1	-
Load on Battery	10128	-	1	-
Output Off Pending	10151	-	1	-
Low Battery - Shutdown Imminent	10152	-	1	-

Table 14 Liebert GXT2™ - Status and Coil

Data Point	Status	Coil	Number of Bits	Notes / Units
Output Overload	10154	-	1	-
Over Temperature Warning	10171	-	1	-
Battery Over Temperature CB Trip	10172	-	1	-
Input Power Supply Fail	10186	-	1	-
Input Over Voltage	10187	-	1	-
Input Under Voltage	10188	-	1	-
Bad Input Frequency	10190	-	1	-
Bypass Input Voltage/Frequency Fault	10202	-	1	-
Output Under Voltage	10218	-	1	-
Output Over Voltage	10219	-	1	-

Table 15 Liebert GXT2 - Input and Holding Registers

Data Point	Input Register	Holding Register	# of Reg.	Scale	Notes / Units
Number of Input Lines	30004	40004	1	1	Bits 12 - 15
Number of Bypass Lines	30004	40004	1	1	Bits 4 - 7
Number of Output Lines	30004	40004	1	1	Bits 8 - 11
Number of SubModules	30009	40009	1	1	-
Load Circuit Present	30013	40013	1	-	There are 16 possible Load Circuits. Each bit represents 1 Load Circuit. Load Circuit 1 is bit 0, Load Circuit 2 is bit 1 and so on. If the bit is 1, then the Load Circuit is supported.
Battery Cabinet Type	30018	40018	2	1	-
Battery Cabinet Number	30019	40019	1	1	-
Battery AmpHour	30020	40020	1	1	AH
Nominal Power Rating	30021	40021	2	1	VA
Nominal Input Voltage	30027	40027	1	1	V
Nominal Output Voltage	30028	40028	1	1	V
Nominal Static Bypass Switch Voltage	30029	40029	1	1	V
Nominal Input Current	30030	40030	1	1	A
Nominal Input Frequency	30031	40031	1	10	Hz
Nominal Output Frequency	30032	40032	1	10	Hz
Nominal Power Factor	30033	40033	1	100	-
Nominal Battery Voltage	30034	40034	1	1	V
Auto Restart Delay	30051	40051	1	1	seconds
Device Low Battery Time	30053	40053	1	1	min
Load (Apparent Power)	30102	-	2	1	VA
Load (Real Power)	30104	-	2	1	W
Load / Capacity	30106	-	1	1	%
Input Frequency	30107	-	1	10	Hz
Output Frequency	30108	-	1	10	Hz
Bypass Frequency	30109	-	1	10	Hz
Battery Charge Status	30112	-	1	-	1 - 100% Charged 2 - Less than 100% Charged 3 - Charging 4 - Discharging 5 - Float Charging 6 - Equalize Charging
Battery Voltage	30113	-	1	1	V
Battery Time Remaining	30115	-	1	1	min
Battery Charge Percentage	30116	-	1	1	%
Ambient Temperature	30119	-	1	1	degrees C

Table 15 Liebert GXT2 - Input and Holding Registers

Data Point	Input Register	Holding Register	# of Reg.	Scale	Notes / Units
Battery Test Result	30130	-	1	-	1 - Unknown 2 - Passed 3 - Failed 4 - In Progress 5 - System Failure 6 - Inhibited
Input Voltage L1	30153	-	1	1	V
Bypass Voltage L1	30159	-	1	1	V
Output Voltage L1	30163	-	1	1	V
Output Current L1	30164	-	1	1	A
Input Maximum Voltage L1	30180	-	1	1	V
Input Minimum Voltage L1	30181	-	1	1	V
Output Maximum Voltage L1	30182	-	1	1	V
Output Minimum Voltage L1	30183	-	1	1	V
Black Out Count	30301	-	1	1	-
Brown Out Count	30302	-	1	1	-

Table 16 Liebert HiNet™ - Status and Coil

Data Point	Status	Coil	Number of Bits	Notes / Units
DC-To-DC Converter On	10042	-	1	-
Load On Inverter	10073	-	1	-
Bypass Active	10074	-	1	-
Load On Battery	10128	-	1	-
Permanently On Bypass	10133	-	1	-
Bypass SCR Open Circuit	10149	-	1	-
Low Battery - Shutdown Imminent	10152	-	1	-
Output Overload	10154	-	1	-
Inverter Unsynchronized	10160	-	1	-
Input Power Supply Fail	10186	-	1	-
Bypass Input Voltage/Frequency Fault	10202	-	1	-

Table 17 Liebert HiNet - Input and Holding Registers

Data Point	Input Register	Holding Register	# of Reg.	Scale	Notes / Units
Number of Input Lines	30004	40004	1	1	Bits 12 - 15
Number of Bypass Lines	30004	40004	1	1	Bits 4 - 7
Number of Output Lines	30004	40004	1	1	Bits 8 - 11
Number of SubModules	30009	40009	1	1	-
Number of Battery Cells	30012	40012	1	1	-
Load (Apparent Power)	30102	-	2	1	VA
Load (Real Power)	30104	-	2	1	W
Input Frequency	30107	-	1	10	Hz
Output Frequency	30108	-	1	10	Hz
Battery Voltage	30113	-	1	1	V
Battery Current (Charge/Discharge)	30114	-	1	1	A
Battery Charge Percentage	30116	-	1	1	%
Ambient Temperature	30119	-	1	1	degrees C
Input Voltage L1	30153	-	1	1	V
Input Current L1	30154	-	1	1	A
Output Voltage L1	30163	-	1	1	V
Output Current L1	30164	-	1	1	A
Input Voltage L2	30203	-	1	1	V
Input Current L2	30204	-	1	1	A
Input Voltage L3	30253	-	1	1	V
Input Current L3	30254	-	1	1	A

Table 18 Liebert Series 600™ UPS - Status and Coil

Data Point	Status	Coil	Number of Bits	Notes / Units
Auto Retransfer Primed	10049	-	1	-
Load On Inverter	10073	-	1	-
Load On Bypass	10074	-	1	-
Battery data Buffer Full	10084	-	1	-
Shutdown Reason – Hardware	10096	-	1	-
Load On Battery	10128	-	1	-
Load On Bypass	10129	-	1	-
Manual Reset Transfer	10130	-	1	-
Emergency Transfer	10134	-	1	-
Battery Switch Open	10136	-	1	-
Input Switch Open	10137	-	1	-
Output Switch open	10138	-	1	-
SBS Unable	10148	-	1	-
Low Battery - Shutdown Imminent	10152	-	1	-
Output Frequency Off	10153	-	1	-
Output Overload	10154	-	1	-
System Emergency Off	10157	-	1	-
Reverse Power	10159	-	1	-
Fan Fail	10169	-	1	-
Over Temperature Warning	10171	-	1	-
Ambient Over Temperature	10173	-	1	-
Input Power Supply Fail	10186	-	1	-
Input Phase Rotation Error	10191	-	1	-
Bypass Input Voltage Fail	10202	-	1	-
Output Under Voltage	10218	-	1	-
Output Over Voltage	10219	-	1	-
DC Ground Fault	10233	-	1	-
DC Cap Fuse Blown	10252	-	1	-
Rectifier Fuse Blown	10257	-	1	-
Inverter Fuse Blown	10261	-	1	-
Customer Alarm 1	10313	-	1	-
Customer Alarm 2	10314	-	1	-
Customer Alarm 3	10315	-	1	-
Customer Alarm 4	10316	-	1	-
Customer Alarm 5	10317	-	1	-
Customer Alarm 6	10318	-	1	-
Customer Alarm 7	10319	-	1	-
Customer Alarm 8	10320	-	1	-

Table 19 Liebert Series 600 UPS - Input and Holding Registers

Data Point	Input Register	Holding Register	# of Reg.	Scale	Notes / Units
Number of Input Lines	30004	40004	1	1	Bits 12 - 15
Number of Bypass Lines	30004	40004	1	1	Bits 4 - 7
Number of Output Lines	30004	40004	1	1	Bits 8 - 11
Nominal Power Rating	30021	40021	2	1	VA
Nominal Input Voltage	30027	40027	1	1	V
Nominal Output Voltage	30028	40028	1	1	V
Nominal Static Bypass Switch Voltage	30029	40029	1	1	V
Nominal Input Current	30030	40030	1	1	A
Nominal Output Frequency	30032	40032	1	10	Hz
Nominal Power Factor	30033	40033	1	100	-
Nominal Battery Voltage	30034	40034	1	1	V
Silence Alarm	-	40101	1	1	-
Load (Apparent Power)	30102	-	2	1	VA
Load (Real Power)	30104	-	2	1	W
Load / Capacity	30106	-	1	1	%
Output Frequency	30108	-	1	10	Hz
Bypass Frequency	30109	-	1	10	Hz
Battery Charge Status	30112	-	1		1 - 100% Charged 2 - Less than 100% Charged
Battery Voltage	30113	-	1	1	V
Battery Current	30114	-	1	1	A
Battery Time Remaining	30115	-	1	1	min
Battery Charge Percentage	30116	-	1	1	%
Input Voltage L1	30153	-	1	1	V
Input Current L1	30154	-	1	1	A
Bypass Voltage L1	30159	-	1	1	V
Bypass Current L1	30160	-	1	1	A
Output Voltage L1	30163	-	1	1	V
Output Current L1	30164	-	1	1	A
Input Voltage L2	30203	-	1	1	V
Input Current L2	30204	-	1	1	A
Bypass Voltage L2	30209	-	1	1	V
Bypass Current L2	30210	-	1	1	A
Output Voltage L2	30213	-	1	1	V
Output Current L2	30214	-	1	1	A
Input Voltage L3	30253	-	1	1	V
Input Current L3	30254	-	1	1	A

Table 19 Liebert Series 600 UPS - Input and Holding Registers

Data Point	Input Register	Holding Register	# of Reg.	Scale	Notes / Units
Bypass Voltage L3	30259	-	1	1	V
Bypass Current L3	30260	-	1	1	A
Output Voltage L3	30263	-	1	1	V
Output Current L3	30264	-	1	1	A
Battery Discharge Count	30308	-	1	1	-
Battery Discharge duration	30309	-	1	1	Seconds
Battery Amp-Hour	30310	-	1	1	AH
Battery Watt-Hour	30311	-	2	1	WH

Table 20 Liebert Series 610™ SCC UPS - Status and Coil

Data Point	Status	Coil	Number of Bits	Notes / Units
Auto Retransfer Primed	10049	-	1	-
Load On Inverter	10073	-	1	-
Load On Bypass	10074	-	1	-
Load On Bypass	10129	-	1	-
Manual Reset Transfer	10130	-	1	-
Emergency Transfer	10134	-	1	-
Output Switch open	10138	-	1	-
SBS Unable	10148	-	1	-
Output Frequency Off	10153	-	1	-
Output Overload	10154	-	1	-
System Emergency Off	10157	-	1	-
Input Power Supply Fail	10186	-	1	-
Input Phase Rotation Error	10191	-	1	-
Bypass Input Voltage Fail	10202	-	1	-
Output Under Voltage	10218	-	1	-
Output Over Voltage	10219	-	1	-
Module Alarm Active	10304	-	1	-
Customer Alarm 1	10313	-	1	-
Customer Alarm 2	10314	-	1	-
Customer Alarm 3	10315	-	1	-
Customer Alarm 4	10316	-	1	-
Customer Alarm 5	10317	-	1	-
Customer Alarm 6	10318	-	1	-
Customer Alarm 7	10319	-	1	-
Customer Alarm 8	10320	-	1	-

Table 21 Liebert Series 610 SCC UPS - Input and Holding Registers

Data Point	Input Register	Holding Register	# of Reg.	Scale	Notes / Units
Number of Input Lines	30004	40004	1	1	Bits 12 - 15
Number of Bypass Lines	30004	40004	1	1	Bits 4 - 7
Number of Output Lines	30004	40004	1	1	Bits 8 - 11
Nominal Power Rating	30021	40021	2	1	VA
Nominal Input Voltage	30027	40027	1	1	V
Nominal Output Voltage	30028	40028	1	1	V
Nominal Static Bypass Switch Voltage	30029	40029	1	1	V
Nominal Output Frequency	30032	40032	1	10	Hz
Nominal Power Factor	30033	40033	1	100	-
Silence Alarm	-	40101	1	1	-
Load (Apparent Power)	30102	-	2	1	VA
Load (Real Power)	30104	-	2	1	W
Load / Capacity	30106	-	1	1	%
Output Frequency	30108	-	1	10	Hz
Bypass Frequency	30109	-	1	10	Hz
Input Voltage L1	30153	-	1	1	V
Bypass Voltage L1	30159	-	1	1	V
Bypass Current L1	30160	-	1	1	A
Output Voltage L1	30163	-	1	1	V
Output Current L1	30164	-	1	1	A
Input Voltage L2	30203	-	1	1	V
Bypass Voltage L2	30209	-	1	1	V
Bypass Current L2	30210	-	1	1	A
Output Voltage L2	30213	-	1	1	V
Output Current L2	30214	-	1	1	A
Input Voltage L3	30253	-	1	1	V
Bypass Voltage L3	30259	-	1	1	V
Bypass Current L3	30260	-	1	1	A
Output Voltage L3	30263	-	1	1	V
Output Current L3	30264	-	1	1	A

Table 22 Liebert Series 300™ UPS - Status and Coil

Data Point	Status	Coil	Number of Bits	Notes / Units
Automatic Restart Enabled	10001	1	1	-
Battery Charge Compensation	10046	-	1	-
Inverter Ready	10047	-	1	-
Load Circuit 1 State	10057	-	1	-
Load Circuit 2 State	10058	-	1	-
Load Circuit 3 State	10059	-	1	-
Load Circuit 4 State	10060	-	1	-
Load Circuit 5 State	10061	-	1	-
Load Circuit 6 State	10062	-	1	-
Load Circuit 7 State	10063	-	1	-
Load Circuit 8 State	10064	-	1	-
Load Circuit 9 State	10065	-	1	-
Load Circuit 10 State	10066	-	1	-
Load Circuit 11 State	10067	-	1	-
Load Circuit 12 State	10068	-	1	-
Load Circuit 13 State	10069	-	1	-
Load Circuit 14 State	10070	-	1	-
Load Circuit 15 State	10071	-	1	-
Load Circuit 16 State	10072	-	1	-
Load On Inverter	10073	-	1	-
Bypass Active	10074	-	1	-
Buck On	10076	-	1	-
Replace Battery	10081	-	1	-
Battery Under Test	10082	-	1	-
Load On Battery	10128	-	1	-
Low Battery - Shutdown Imminent	10152	-	1	-
Output Overload	10154	-	1	-
Over Temperature Warning	10171	-	1	-
Battery Over Temperature CB Trip	10172	-	1	-
Input Power Supply Fail	10186	-	1	-
Input Over Voltage	10187	-	1	-
Input Under Voltage	10188	-	1	-
Bad Input Frequency	10190	-	1	-
Bypass Input Voltage/Frequency Fault	10202	-	1	-
Output Under Voltage	10218	-	1	-
Output Over Voltage	10219	-	1	-
Battery Charger Fail	10234	-	1	-

Table 23 Liebert Series 300 UPS - Input and Holding Registers

Data Point	Input Register	Holding Register	# of Reg.	Scale	Notes / Units
Number of Input Lines	30004	40004	1	1	Bits 12 - 15
Number of Bypass Lines	30004	40004	1	1	Bits 4 - 7
Number of Output Lines	30004	40004	1	1	Bits 8 - 11
Number of SubModules	30009	40009	1	1	-
Load Circuit Present	30013	40013	1	-	There are 16 possible Load Circuits. Each bit represents 1 Load Circuit. Load Circuit 1 is bit 0, Load Circuit 2 is bit 1 and so on. If the bit is 1, then the Load Circuit is supported.
Nominal Power Rating	30021	40021	2	1	VA
Nominal Input Voltage	30027	40027	1	1	V
Nominal Output Voltage	30028	40028	1	1	V
Nominal Static Bypass Switch Voltage	30029	40029	1	1	V
Nominal Input Current	30030	40030	1	1	A
Nominal Input Frequency	30031	40031	1	10	Hz
Nominal Output Frequency	30032	40032	1	10	Hz
Nominal Power Factor	30033	40033	1	100	-
Nominal Battery Voltage	30034	40034	1	1	V
Device Low Battery Time	30053	40053	1	1	min
Load (Apparent Power)	30102	-	2	1	VA
Load (Real Power)	30104	-	2	1	W
Load / Capacity	30106	-	1	1	%
Input Frequency	30107	-	1	10	Hz
Output Frequency	30108	-	1	10	Hz
Bypass Frequency	30109	-	1	10	Hz
Battery Charge Status	30112	-	1	1	1 - 100% Charged 2 - Less than 100% Charged
Battery Voltage	30113	-	1	1	V
Battery Current	30114	-	1	1	A
Battery Time Remaining	30115	-	1	1	min
Battery Charge Percentage	30116	-	1	1	%
Battery Test Result	30130	-	1	1	1 - Unknown 2 - Passed 3 - Failed 4 - In Progress 5 - System Failure 6 - Inhibited
Input Voltage L1	30153	-	1	1	V
Input Current	30154	-	1	1	A
Bypass Voltage L1	30159	-	1	1	V
Bypass Current L1	30160	-	1	1	A

Table 23 Liebert Series 300 UPS - Input and Holding Registers

Data Point	Input Register	Holding Register	# of Reg.	Scale	Notes / Units
Output Voltage L1	30163	-	1	1	V
Output Current L1	30164	-	1	1	A
Input Voltage L2	30203	-	1	1	V
Input Current L2	30204	-	1	1	A
Bypass Voltage L2	30209	-	1	1	V
Bypass Current L2	30210	-	1	1	A
Output Voltage L2	30213	-	1	1	V
Output Current L2	30214	-	1	1	A
Input Voltage L3	30253	-	1	1	V
Input Current L3	30254	-	1	1	A
Bypass Voltage L3	30259	-	1	1	V
Bypass Current L3	30260	-	1	1	A
Output Voltage L3	30263	-	1	1	V
Output Current L3	30264	-	1	1	A
Black Out Count	30301	-	1	1	-
Brown Out Count	30302	-	1	1	-
Transient Count	30301	-	1	1	-
Silent Audible Alarm	-	40101	-	-	any value
Battery Start	-	40102	1	1	1=Start, 0=Abort
Open UPS Output Switch	-	40104	-	-	Delay time in Seconds, last digit will be ignored
Reboot UPS Output Switch	-	40105	1	1	Delay time in Seconds, last digit will be ignored
Close UPS Output Switch	-	40106	-	-	Delay time in Seconds, last digit will be ignored
Transfer Load to Bypass	-	40107	1	1	any value
Transfer Load to Inverter	-	40108			any value
Reset UPS Statistic data	-	40111	1	1	any value
Turn UPS Outlets On	-	40112	1	1	Bitmap mask for Outlet 1-16. All bits set to 1 will be turned On
Turn UPS Outlets Off	-	40113	1	1	Bitmap mask for Outlet 1-16. All bits set to 1 will be turned Off

Table 24 Liebert DS™ - Status and Coil

Data Description	Status	Coil	Number of Bits	Notes
Sleep on Monday	10001	1	1	-
Sleep on Tuesday	10002	2	1	-
Sleep on Wednesday	10003	3	1	-
Sleep on Thursday	10004	4	1	-
Sleep on Friday	10005	5	1	-
Sleep on Saturday	10006	6	1	-
Sleep on Sunday	10007	7	1	-
Supply Limit Enable	10008	8	1	-
Reheat Lockout	10009	9	1	-
Humidifier Lockout	10010	10	1	-
Temperature Indication [1]	10011	11	1	-
Timer Mode Type	10012	12	1	-
Minimum Chilled Water Temp Enable	10013	13	1	-
Std. Sensor Alarms Enable	10019	19	1	-
Sensor A Alarms Enable	10020	20	1	-
Compressor Lockout	10021	21	1	-
VSD Fan speed	10022	22	1	-
Unit Control	-	25	1	-
Reset Alarm	-	26	1	-
Acknowledge Alarm	-	27	1	-
Reset Total Run Hours Fan Motor	-	28	1	-
Reset Comp1Run Hour	-	29	1	-
Reset Comp2Run Hour	-	30	1	-
Reset Humidifier Run Hour	-	31	1	-
Reset Dehumidifier Run Hour	-	32	1	-
Reset CW/FC Run Hour	-	33	1	-
Reset E-Heater1RunHour	-	34	1	-
Reset E-heater2RunHour	-	35	1	-
Reset E-heater3 Run Hour	-	36	1	-
Reset HG/HW Run Hour	-	37	1	-
Fan On	10025	-	1	-
Cool On	10026	-	1	-
Free Cool On	10027	-	1	-
Hot Water On	10028	-	1	-
Electrical Heater On	10029	-	1	-
Humidification On	10030	-	1	-
Dehumidification On	10031	-	1	-
Audible Alarm On	10032	-	1	-

Table 24 Liebert DS™ - Status and Coil

Data Description	Status	Coil	Number of Bits	Notes
Reserved	10033	-	1	-
Main Fan Overload	10034	-	1	-
Loss of Airflow	10035	-	1	-
Loss of Flow	10036	-	1	-
Comp 1 High Pressure	10037	-	1	-
Comp 1 Low Pressure	10038	-	1	-
Comp 1 Overload	10039	-	1	-
Comp 1 Pumpdown Fail	10040	-	1	-
Comp 2 High Pressure	10041	-	1	-
Comp 2 Low Pressure	10042	-	1	-
Comp 2 Overload	10043	-	1	-
Comp 2 Pumpdown Fail	10044	-	1	-
Digital Scroll Compressor 1 High Temperature	10045	-	1	-
Digital Scroll Compressor 2 High Temperature	10046	-	1	-
Smoke Detected	10047	-	1	-
Water Under Floor	10048	-	1	-
Humidifier Problem	10049	-	1	-
Stby Glycol Pump On	10050	-	1	-
Standby Unit On	10051	-	1	-
Cond Pump-high Water	10052	-	1	-
Room Sensor Failure	10053	-	1	-
Loss Compressor Power	10054	-	1	-
Loss of Air Blower 1	10055	-	1	-
Humidifier Low Water	10058	-	1	-
Humidifier High Amps	10059	-	1	-
High Temperature	10060	-	1	-
Loss of Power	10061	-	1	-
Unspecified Event(s) [1]	10064	-	1	-
High CW Temp	10065	-	1	-
Reserved	10066	-	1	-
High Room Temp	10067	-	1	-
Low Room Temp	10068	-	1	-
High Room Hum	10069	-	1	-
Low Room Hum	10070	-	1	-
High Temp Sensor A	10071	-	1	-
Low Temp Sensor A	10072	-	1	-
High Hum Sensor A	10073	-	1	-
Low Hum Sensor A	10074	-	1	-
Loss of CW Flow	10075	-	1	-

Table 24 Liebert DS™ - Status and Coil

Data Description	Status	Coil	Number of Bits	Notes
Clogged Filters	10076	-	1	-
Supply Sensor Failure	10077	-	1	-
Freecool Temp Sensor	10078	-	1	-
Sensor A Failure	10079	-	1	-
Unit Hrs Exceeded	10080	-	1	-
Comp 1 Hrs Exceeded	10081	-	1	-
Comp 2 Hrs Exceeded	10082	-	1	-
FC Hrs Exceeded	10083	-	1	-
El Heat1 Hrs Exceeded	10084	-	1	-
El Heat2 Hrs Exceeded	10085	-	1	-
El Heat3 Hrs Exceeded	10086	-	1	-
HW/HG Hrs Exceeded	10087	-	1	-
Hum Hrs Exceeded	10088	-	1	-
Dehum Hrs Exceeded	10089	-	1	-
Network Failure	10091	-	1	-
No Connection W/Unit	10092	-	1	-
Unit(s) Disconnected	10093	-	1	-
Unit Code Missing	10094	-	-	-
Unit Code Mismatch	10095	-	-	-
Call Service	10096	-	-	-
Low Memory 1	10097	-	-	-
RAM / Battery Failure	10098	-	-	-
HCB not connected	10099	-	-	-
(Parallel Flash) Memory 1 Fail	10100	-	-	-
(Serial Flash) Memory 2 Fail	10101	-	-	-
Customer Input 1	10104	-	-	-
Customer Input 2	10105	-	-	-
Customer Input 3	10106	-	-	-
Customer Input 4	10107	-	-	-
Digital Scroll Compressor 1 Sensor Fail	10108	-	-	-
Digital Scroll Compressor 2 Sensor Fail	10109	-	-	-

Reference Document: ST100I&C PA Parameters and Events, Version 18.0

1. Any non-recognized alarm code by current firmware received from the DS control will trigger this event.

Table 25 Liebert DS - Input and Holding Registers

Data Description	Input Register	Holding Register	# of Reg.	Scale	Note
Vendor ID	30001	40001	1	1	-
Device ID	30002	40002	1	1	-
Version Number	30003	40003	1	1	-
UPS/Env/Pwr	30004	40004	1	1	-
Timer Mode [1]	30016	40016	1	1	-
Type of DT Room-FC [2]	30017	40017	1	1	-
Humidity Control [3]	30018	40018	1	1	-
VSD Setpoint	30019	40019	1	1	% (HP)
Supply Temperature Limit	30020	40020	1	x10	C°
DT between Room and FC	30021	40021	1	x10	C°
Minimum CW Temperature	30022	40022	1	x10	C°
Temperature Setpoint	30023	40023	1	x10	C°
Temperature Proportional Band	30024	40024	1	x10	C°
Temperature Deadband	30025	40025	1	x10	C°
Temperature Integration Time	30026	40026	1	1	Min
Humidity Setpoint	30027	40027	1	1	%
Humidity Proportional Band	30028	40028	1	1	%
Humidity Integration Time	30029	40029	1	1	Min
Humidity Deadband	30030	40030	1	1	%
Single Unit Auto-Restart Delay	30031	40031	1	1	Sec
Infrared Flush Rate	30032	40032	1	1	%
Temp Control Type [4]	30033	40033	1	1	-
Sleep Interval 1 Start Time Hour: Minute	30040	40040	1	-	LSB:Min
Sleep Interval 1 End Time Hour: Minute	30041	40041	1	-	LSB:Min
Sleep Interval 2 Start Time Hour: Minute	30042	40042	1	-	LSB:Min
Sleep Interval 2 End Time Hour: Minute	30043	40043	1	-	LSB:Min
Timer Deadband	30044	40044	1	x10	C°
Manual VSD Timer/Counter [5]	30045	40045	1	-	-
High Temperature	30050	40050	1	x10	C°
Low Temperature	30051	40051	1	x10	C°
High Temperature Sensor A	30052	40052	1	x10	C°
Low Temperature Sensor A	30053	40053	1	x10	C°
High Humidity	30054	40054	1	1	%
Low Humidity	30055	40055	1	1	%
High Humidity Sensor A	30056	40056	1	1	%
Low Humidity Sensor A	30057	40057	1	1	%
Fan Run Hour Threshold	30070	40070	-	1	Hour
Compressor 1 Run Hour Threshold	30071	40071	-	1	Hour
Compressor 2 Run Hour Threshold	30072	40072	-	1	Hour

Table 25 Liebert DS - Input and Holding Registers

Data Description	Input Register	Holding Register	# of Reg.	Scale	Note
Humidifier Run Hours Threshold	30073	40073	-	1	Hour
Dehumidification Run Hours Threshold	30074	40074	-	1	Hour
CW/FC Run Hours Threshold	30075	40075	-	1	Hour
Electrical Heaters #1 Run Hours Threshold	30076	40076	-	1	Hour
Electrical Heaters #2 Run Hours Threshold	30077	40077	-	1	Hour
Electrical Heaters #3 Run Hours Threshold	30078	40078	-	1	Hour
Hot Water / Hot Gas Run Hours Threshold	30079	40079	-	1	Hour
Operating State [6]	30100	-	-	1	-
Number of Active Events/Alarm	30101	-	-	-	-
Summary Alarm Status [7]	30102	-	-	-	-
Fan Ramp	30103	-	-	1	%
Cooling Ramp	30104	-	-	1	%
Free Cooling Ramp	30105	-	-	1	%
Heating Ramp	30106	-	-	1	%
Humidification Ramp	30107	-	-	1	%
Dehumidifier Ramp	30108	-	-	1	%
FreeCooling Status [8]	30109	-	-	1	%
Return Temperature	30110	-	-	x10	C°
Actual Temperature SP	30111	-	-	x10	C°
Supply Temperature	30112	-	-	x10	C°
Actual Supply Temperature SP	30113	-	-	x10	C°
FC Temperature	30115	-	-	x10	C°
Sensor A Temperature	30116	-	-	x10	C°
Sensor B Temperature	30117	-	-	x10	C°
Sensor C Temperature	30118	-	-	x10	C°
Digital Scroll Compressor 1 High Temperature	30119	-	-	x10	C°
Digital Scroll Compressor 2 High Temperature	30120	-	-	x10	C°
Return Humidity	30130	-	-	1	%
Actual Humidity SP	30131	-	-	1	%
Sensor A Humidity	30132	-	-	1	%
Sensor B Humidity	30133	-	-	1	%
Sensor C Humidity	30134	-	-	1	%
Fan Run Hour	30141	-	-	1	Hour
Compressor 1 Run Hour	30142	-	-	1	Hour
Compressor 2 Run Hour	30143	-	-	1	Hour

Table 25 Liebert DS - Input and Holding Registers

Data Description	Input Register	Holding Register	# of Reg.	Scale	Note
Humidifier Run Hours	30144	-	-	1	Hour
Dehumidification Run Hours	30145	-	-	1	Hour
Free cooling Run Hours	30146	-	-	1	Hour
Electrical Heaters #1 Run Hours	30147	-	-	1	Hour
Electrical Heaters #2 Run Hours	30148	-	-	1	Hour
Electrical Heaters #3 Run Hours	30149	-	-	1	Hour
Hot Water / Hot Gas Run Hours	30150	-	-	1	Hour
Daily High Temperature	30151	-	-	x10	C°
Daily High Temp Time	30152	-	-	x1	Hh:mm
Daily Low Temperature	30153	-	-	x10	C°
Daily Low Temp Time	30154	-	-	x1	Hh:mm
Daily High Humidity	30155	-	-	x1	%RH
Daily High Hum Time	30156	-	-	x1	Hh:mm
Daily Low Humidity	30157	-	-	x1	%RH
Daily Low Hum Time	30158	-	-	x1	Hh:mm

Reference Document: ST100I&C PA Parameters and Events, Version 18.0

1. Timer mode: 0 = no, 1 = yes
2. Type of DT Room-Glycol: 0 = no, 1 = contact, 2 = value
3. Predictive Hum Control: 0 = relative, 1 = compensated, 2 = predictive
4. Temp Control Algorithm: 0 = proportional, 1 = PD, 2 = PDI; 3 = intelligent
5. When VFD is set to manual mode (coil 22), the host can control the VFD by the value of register 40019. The Manual VSD Timer will start to count down. Once it reaches 0, the VFD control mode will switch to auto. The host will need to periodically reset this timer in order to maintain the manual mode. Consult factory for BMS timer information.
6. Operating state:
   - Bit 0-1: 00 unit off, 01 unit on, 10 unit standby
   - Bit 2-3: 00 auto, 01 manual
   - Bit 4-7: 0000 none
     0001 local user
     0010 alarm
     0011 schedule
     0100 remote user
     0101 external device
     0110 local display
7. Alarm state bit map:
   - Bit 0 = Reset state
   - Bit 1 = Active state
   - Bit 2 = Acknowledge state
   - Bit 3-7 = Alarm Type
     00000: Message
     00001: Warning
     00010: Alarm
8. Free-cool state: 0 = Off, 1 = Start, 2 = On

Table 26 Liebert XDF™ - Status and Coil

Data Description	Status	Coil	Number of Bits	Notes
Temperature Indication [1]	10011	11	1	-
Unit Control	-	25	1	-
Reset Alarm	-	26	1	-
Acknowledge Alarm	-	27	1	-
Cabinet Sensor Alarm Enable	10023	23	1	-
Safe Door Open Symbol	10024	24	1	-
Fan On	10025	-	1	-
Cool On	10026	-	1	-
Digital Scroll Compressor 1 High Temperature	10045	-	1	-
Smoke Detected	10047	-	1	-
Water Under Floor	10048	-	1	-
Humidifier Problem	10049	-	1	-
Stby Glycol Pump On	10050	-	1	-
Standby Unit On	10051	-	1	-
Cond Pump-High Water	10052	-	1	-
Room Sensor Failure	10053	-	1	-
Loss Compressor Power	10054	-	1	-
Loss of Air Blower 1	10055	-	1	-
Humidifier Low Water	10058	-	1	-
Humidifier High Amps	10059	-	1	-
High Temperature	10060	-	1	-
Loss of Power	10061	-	1	-
Remote Shutdown	10062	-	1	-
Unspecified Event(s) [1]	10064	-	1	-
High CW Temp	10065	-	1	-
Reserved	10066	-	1	-
High Room Temp	10067	-	1	-
Low Room Temp	10068	-	1	-
High Room Hum	10069	-	1	-
Low Room Hum	10070	-	1	-
High Temp Sensor A	10071	-	1	-
Low Temp Sensor A	10072	-	1	-
High Hum Sensor A	10073	-	1	-
Low Hum Sensor A	10074	-	1	-
Loss of CW Flow	10075	-	1	-
Clogged Filters	10076	-	1	-
Supply Sensor Failure	10077	-	1	-
Freecool Temp Sensor	10078	-	1	-

Table 26 Liebert XDF™ - Status and Coil

Data Description	Status	Coil	Number of Bits	Notes
Sensor A Failure	10079	-	1	-
Unit Hrs Exceeded	10080	-	1	-
Comp 1 Hrs Exceeded	10081	-	1	-
Comp 2 Hrs Exceeded	10082	-	1	-
FC Hrs Exceeded	10083	-	1	-
El Heat1 Hrs Exceeded	10084	-	1	-
El Heat2 Hrs Exceeded	10085	-	1	-
El Heat3 Hrs Exceeded	10086	-	1	-
HW/HG Hrs Exceeded	10087	-	1	-
Hum Hrs Exceeded	10088	-	1	-
Dehum Hrs Exceeded	10089	-	1	-
Network Failure	10091	-	1	-
No Connection W/Unit 1	10092	-	1	-
Unit(s) Disconnected	10093	-	1	-
Unit Code Missing	10094	-	-	-
Unit Code Mismatch	10095	-	-	-
Call Service	10096	-	-	-
Low Memory 1	10097	-	-	-
Ram / Battery Failure	10098	-	-	-
HCB Not Connected	10099	-	-	-
(Parallel Flash) MEMORY 1 FAIL	10100	-	-	-
(Serial Flash) MEMORY 2 FAIL	10101	-	-	-
Customer Input 1	10104	-	-	-
Customer Input 2	10105	-	-	-
Customer Input 3	10106	-	-	-
Customer Input 4	10107	-	-	-
Digital Scroll Compressor 1 Sensor Fail	10108	-	-	-
Digital Scroll Compressor 2 Sensor Fail	10109	-	-	-
Low Int Temperature	10110	-	-	-
High Ext Dewpoint	10111	-	-	-
Cabinet Temp Sensor Fail	10112	-	-	-
Cabinet Humidity Sensor Fail	10113	-	-	-
Ambient Temp Sensor Fail	10114	-	-	-
Unit Disabled	10129	-	-	-
Unit Shut Down	10130	-	-	-
Unit Synchronization	10131	-	-	-
Comp 1 Short Cycle	10132	-	-	-
Comp 2 Short Cycle	10133	-	-	-

Table 26 Liebert XDF™ - Status and Coil

Data Description	Status	Coil	Number of Bits	Notes
Unit On	10134	-	-	-
Unit Off	10135	-	-	-
Sleep Mode	10136	-	-	-
Power On	10137	-	-	-
Standby Mode	10138	-	-	-
Power Off	10139	-	-	-
Reheat Lockout	10140	-	-	-
Humidifier Lockout	10141	-	-	-
Compressor(s) Lockout	10142	-	-	-
Backup Ventilation	10143	-	-	-
Door Open	10144	-	-	-
Service Due	10145	-	-	-

Reference Document: ST100I&C PA Parameters and Events, Version 18.0

1. Any non-recognized alarm code by current firmware received from the XDF control will trigger this event.

Table 27 Liebert XDF - Input and Holding Registers

Data Description	Input Register	Holding Register	# of Reg.	Scale	Note
Vendor ID	30001	40001	1	1	-
Device ID	30002	40002	1	1	-
Version number	30003	40003	1	1	-
UPS/Env/Pwr	30004	40004	1	1	-
Timer Mode [1]	30016	40016	1	1	-
Type of DT Room-FC [2]	30017	40017	1	1	-
Temperature Setpoint	30023	40023	1	x10	C°
Delay after safe Temp has been reached	30034	40034	-	-	Minute
Allowable deviation between internal temp sensors	30035	40035	-	-	C°
High Temperature	30050	40050	1	x10	C°
Low Temperature	30051	40051	1	x10	C°
High Cabinet Temperature Setpoint	30058	40058	-	x10	C°
Low Cabinet Temperature Setpoint	30059	40059	-	x10	C°
Fan Run Hour Threshold	30070	40070	-	1	Hour
Compressor 1 Run Hour Threshold	30071	40071	-	1	Hour
Service Ramp	30099	-	-	1	%
Operating State [6]	30100	-	-	1	-
Number of Active Events/Alarm	30101	-	-	-	-
Summary Alarm Status [7]	30102	-	-	-	-
Fan Ramp	30103	-	-	1	%
Cooling Ramp	30104	-	-	1	%
Actual Temperature SP	30111	-	-	x10	C°
Digital Scroll Compressor 1 High Temperature	30119	-	-	x10	C°
Sensor 1 Temp	30121	-	-	-	C°
Sensor 2 Temp	30122	-	-	-	C°
Sensor 3 Temp	30123	-	-	-	C°
Sensor 4 Temp	30124	-	-	-	C°
Ambient Temp	30125	-	-	-	C°
Ambient Humidity	30126	-	-	-	%
Dew Point Temp	30127	-	-	-	C°
Adjusted Setpoint Temp	30128	-	-	-	C°
Cabinet Temperature	30129	-	-	-	C°
Service Due Year Month	30135	-	-	-	-
Device kW Load	30136	-	-	-	kW
Fan Run Hour	30141	-	-	1	Hour
Compressor 1 Run Hour	30142	-	-	1	Hour
Daily High Temperature	30151	-	-	x10	C°

Table 27 Liebert XDF - Input and Holding Registers

Data Description	Input Register	Holding Register	# of Reg.	Scale	Note
Daily High Temp Time	30152	-	-	x1	Hh:mm
Daily Low Temperature	30153	-	-	x10	C°
Daily Low Temp Time	30154	-	-	x1	Hh:mm

Reference Document: ST100I&C PA Parameters and Events, Version 18.0

1. Timer mode: 0 = no, 1 = yes
2. Type of DT Room-Glycol: 0 = no, 1 = contact, 2 = value
3. Predictive Hum Control: 0 = relative, 1 = compensated, 2 = predictive
4. Temp Control Algorithm: 0 = proportional, 1 = PD, 2 = PDI; 3 = intelligent
5. When VFD is set to manual mode (coil 22), the host can control the VFD by the value of register 40019. The Manual VSD Timer will start to count down. Once it reaches 0, the VFD control mode will switch to auto. The host will need to periodically reset this timer in order to maintain the manual mode. Consult factory for BMS timer information.
6. Operating state:
   - Bit 0-1: 00 unit off, 01 unit on, 10 unit standby
   - Bit 2-3: 00 auto, 01 manual
   - Bit 4-7: 0000 none
     0001 local user
     0010 alarm
     0011 schedule
     0100 remote user
     0101 external device
     0110 local display
7. Alarm state bit map:
   - Bit 0 = Reset state
   - Bit 1 = Active state
   - Bit 2 = Acknowledge state
   - Bit 3-7 = Alarm Type
     00000: Message
     00001: Warning
     00010: Alarm
8. Free-cool state: 0 = Off, 1 = Start, 2 = On

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